

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions, and listings, of claims in the present application.

IN THE CLAIMS:

Claim 1. (Canceled).

Claim 2. (Previously Presented) The method according to claim 24, wherein the nucleotide sequence is operably ligated to a promoter sequence and a terminator sequence both of which are functional in the plant cell.

Claims 3-4. (Canceled).

Claim 5. (Previously Presented) The method according to claim 24, wherein the weed control compound inhibits porphyrin biosynthesis of a plant.

Claim 6. (Previously Presented) The method according to claim 24, wherein the weed control compound is a protoporphyrinogen IX oxidase inhibitory-type herbicidal compound.

Claims 7-23. (Canceled).

Claim 24. (Previously Presented) A method for producing a transgenic plant which is resistant to a weed control compound, comprising the steps of:

introducing into a plant cell, a nucleotide sequence encoding a variant of plant protoporphyrinogen IX oxidase that lacks the FAD binding sequence;

expressing the nucleotide sequence; and

regenerating said plant cell into a transgenic plant.

Claim 25. (Previously Presented) The method according to Claim 24, wherein the variant of plant protoporphyrinogen IX oxidase is derived from soybean.

Claims 26-42. (Canceled).

Claim 43. (Previously Presented) A weed control compound-resistant plant produced by the method of claim 24.

Claim 44. (Canceled).

Claim 45. (Previously Presented) A method for protecting a plant which comprises applying a weed control compound to a growth area of the plant of claim 43.

Claim 46. (Canceled).

Claim 47. (Original) A method for selecting a plant which comprises applying a weed control compound to which the plant of claim 43 is resistant to a growth area of the plant of claim 43 and other plants, and selecting either plant on the basis of difference in growth between the plants.

Claim 48. (Canceled).

Claim 49. (Original) The method according to claim 47, wherein the plants are plant cells.

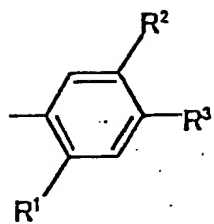
Claim 50. (Canceled).

Claim 51. (Currently Amended) The method according to claim 24, wherein the weed control compound is a protoporphyrinogen IX

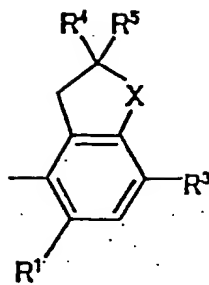
oxidase inhibitory-type herbicidal compound selected from the compounds of (1) to (3) below:

(1) chlormethoxynil, bifenox, chlornitrofen, acifluorfen and its ethyl ester, acifluorfen-sodium, oxyfluorfen, oxadiazon, 2-[4-chloro-2-fluoro-5-(prop-2-ynyloxy)phenyl]-2,3,4,5,6,7-hexahydro-1H-isoindol-1,3-dione, chlorphthalim, TNPP-ethyl, or N3-(1-phenylethyl)-2,6-dimethyl-5-propyonylnicotinamide;

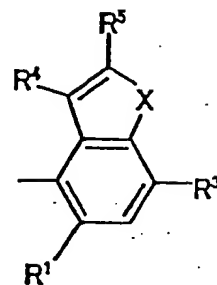
(2) a compound represented by the general formula: J-G (I), wherein G is a group represented by any one of the following general formulas G-1 to G-9 and J is a group represented by any one of the following general formulas J-1 to J-30:



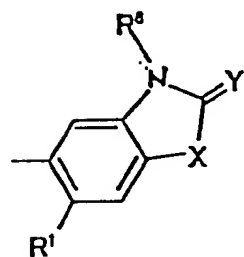
G-1



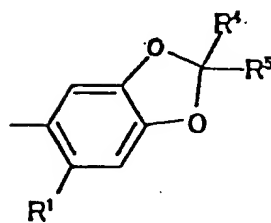
G-2



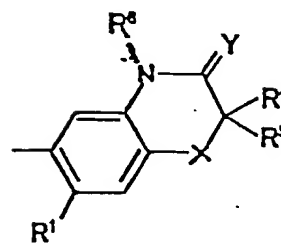
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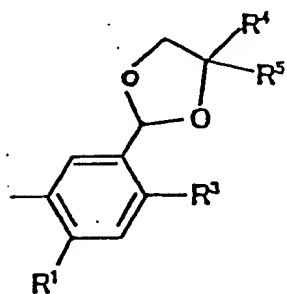
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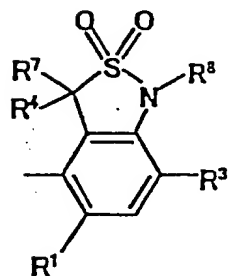
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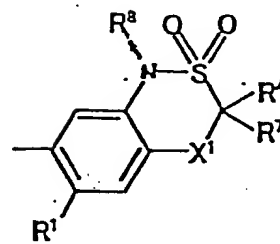
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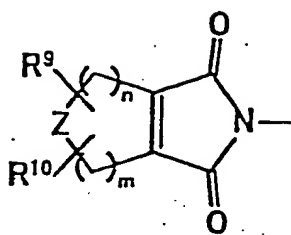
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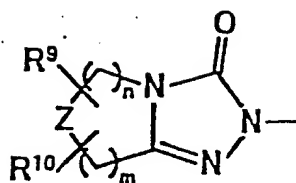
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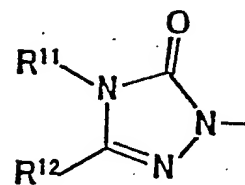
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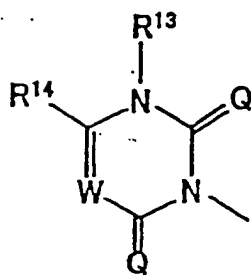
J-1



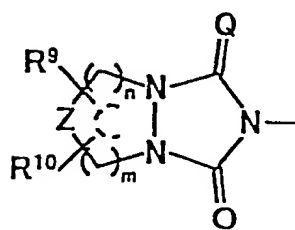
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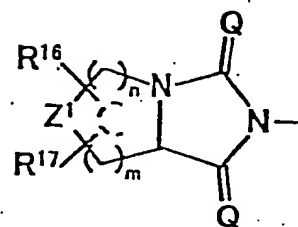
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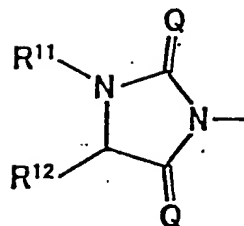
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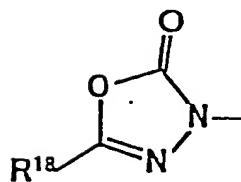
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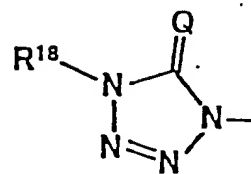
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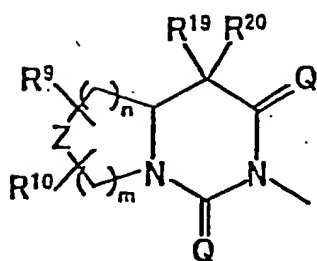
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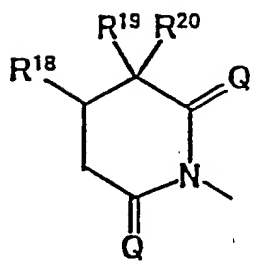
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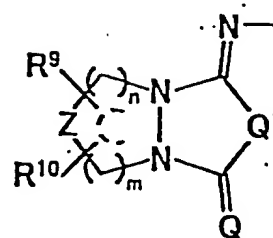
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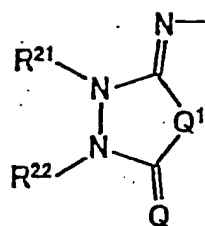
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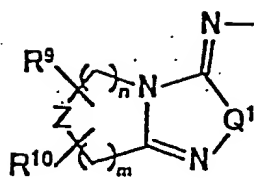
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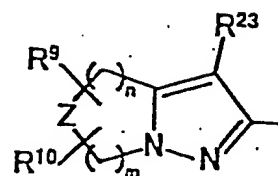
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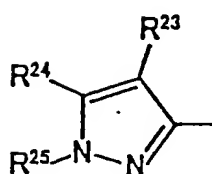
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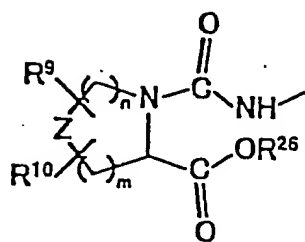
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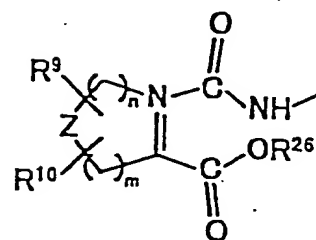
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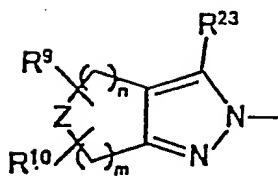
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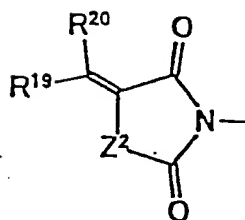
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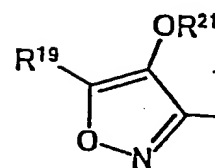
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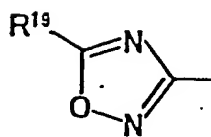
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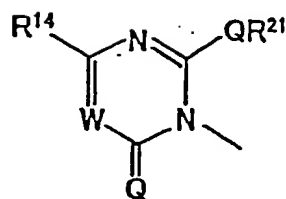
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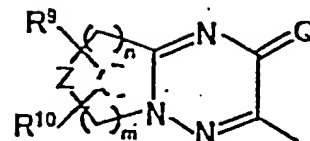
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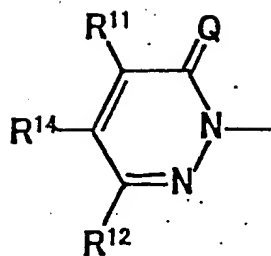
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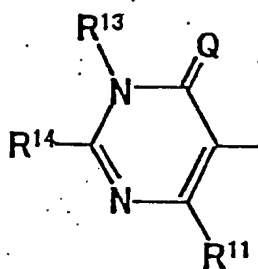
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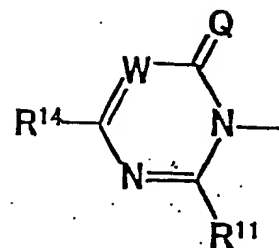
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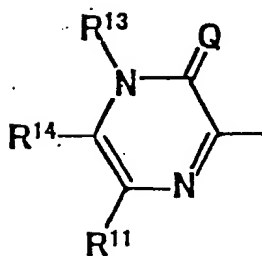
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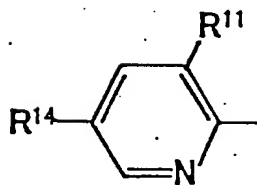
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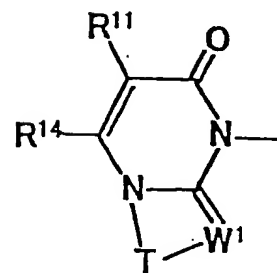
J-27



J-28



J-29



J-30

wherein the dotted lines in the formulas J-5, J-6, J-12 and J-24 represent that the left hand ring contains only single bonds, or one bond in the ring is a double bond between carbon atoms;

X is oxygen atom or sulfur atom;

Y is oxygen atom or sulfur atom;

~~R1 is hydrogen atom or halogen atom;~~

~~R2 is hydrogen atom, C1-C8alkyl group, C1-C8 haloalkyl group, halogen atom, OH group, OR27 group, SH group, S(O)pR27 group, COR27 group, CO2R27 group, C(O)SR27 group, C(O)NR29R30 group, CHO group, CR27-NOR36 group, CH=CR37CO2R27 group, CH2CHR37CO2R27 group, CO2N-CR31R32 group, nitro group, cyano group, NHSO2R33 group, NHSO2NHR33 group, NR27R38 group, NH2 group or phenyl group optionally substituted with one or more and the same or different C1-C4 alkyl groups,~~

~~p is 0, 1 or 2,~~

~~R3 is C1-C2 alkyl group, C1-C2 haloalkyl group, OCH3 group, SCH3 group, OCHF2 group, halogen atom, cyano group or nitro group,~~

~~R4 is hydrogen atom, C1-C3 alkyl group, C1-C3 haloalkyl group or halogen atom,~~

~~R5 is hydrogen atom, C1-C3 alkyl group, halogen atom, C1-C3 haloalkyl group, cyclopropyl group, vinyl group, C2-alkynyl group, cyano group, C(O)R38 group, CO2R38 group, C(O)NR38R39 group, CR34R35CN group, CR34R35C(O)R38 group, CR34R35CO2R38 group, CR34R35C(O)NR38R39 group, CHR34OH group, CHR34OC(O)R38 group or OCHR34OC(O)NR38R39 group, or, when G is C-2 or G-6, R4 and R5 may form C=O group together with the carbon atom to which they are attached,~~

~~R6 is C1-C6 alkyl group, C1-C6 haloalkyl group, C2-C6 alkoxyalkyl group, C3-C6 alkenyl group or C3-C6 alkynyl group;~~

~~X1 is single bond, oxygen atom, sulfur atom, NH group, N(C1-C3 alkyl) group, N(C1-C3 haloalkyl) group or N(allyl) group;~~

~~R7 is hydrogen atom, C1-C6 alkyl group, C1-C6 haloalkyl group, halogen atom, S(O)₂(C1-C6alkyl) group or C(=O)R40 group;~~

~~R8 is hydrogen atom, C1-C8 alkyl group, C3-C8 cycloalkyl group, C3-C8 alkenyl group, C3-C8 alkynyl group, C1-C8 haloalkyl group, C2-C8 alkoxyalkyl group, C3-C8 alkoxyalkoxyalkyl group, C3-C8 haloalkynyl group, C3-C8 haloalkenyl group, C1-C8 alkylsulfonyl group, C1-C8 haloalkylsulfonyl group, C3-C8 alkoxycarbonylalkyl group, S(O)₂NH(C1-C8 alkyl) group, C(O)R41 group or benzyl group whose phenyl ring may be substituted with R42;~~

~~n and m are independently 0, 1, 2 or 3 and m + n is 2 or 3;~~

~~Z is CR⁹R¹⁰ group, oxygen atom, sulfur atom, S(O) group, S(O)₂ group or N(C1-C4 alkyl) group;~~

~~each R9 is independently hydrogen atom, C1-C3 alkyl group, halogen atom, hydroxyl group, C1-C6 alkoxy group, C1-C6 haloalkyl group, C1-C6 haloalkoxy group, C2-C6 alkylcarbonyloxy group or C2-C6 haloalkylcarbonyloxy group;~~

~~each R10 is independently hydrogen atom, C1-C3 alkyl group, hydroxyl group or halogen atom;~~

~~R11 and R12 are independently hydrogen atom, halogen atom, C1-C6 alkyl group, C3-C6 alkenyl group or C1-C6 haloalkyl group;~~

~~R13 is hydrogen atom, C1-C6 alkyl group, C1-C6 haloalkyl group, C3-C6 alkenyl group, C3-C6 haloalkenyl group, C3-C6 alkynyl group, C3-C6 haloalkynyl group, HC(=O) group, (C1-C4 alkyl)C(=O) group or NH2 group;~~

~~R14 is C1-C6 alkyl group, C1-C6 alkylthio group, C1-C6 haloalkyl group or N(CH3)2 group;~~

~~W is nitrogen atom or CR15;~~

~~R15 is hydrogen atom, C1-C6 alkyl group, halogen atom, or phenyl group optionally substituted with C1-C6 alkyl group, one or two halogen atoms, C1-C6 alkoxy group or CF3 group;~~

~~each Q is independently oxygen atom or sulfur atom;~~

~~Q1 is oxygen atom or sulfur atom;~~

~~Z1 is CR16R17 group, oxygen atom, sulfur atom, S(O) group, S(O)2 group or N(C1-C4alkyl) group;~~

~~each R16 is independently hydrogen atom, halogen atom, hydroxyl group, C1-C6 alkoxy group, C1-C6 haloalkyl group, C1-C6~~

~~haloalkoxy group, C2-C6 alkylcarbonyloxy group or C2-C6 haloalkylcarbonyloxy group;~~

~~each R17 is independently hydrogen atom, hydroxyl group or halogen atom;~~

~~R18 is C1-C6 alkyl group, halogen atom or C1-C6 haloalkyl group;~~

~~R19 and R20 are independently hydrogen atom, C1-C6 alkyl group, or C1-C6 haloalkyl group;~~

~~Z2 is oxygen atom, sulfur atom, NR9 group or CR9R10 group;~~

~~R21 and R22 are independently C1-C6 alkyl group, C1-C6 haloalkyl group, C3-C6 alkenyl group, C3-C6 haloalkenyl group, C3-C6 alkynyl group or C3-C6 haloalkynyl group;~~

~~R23 is hydrogen atom, halogen atom or cyano group;~~

~~R24 is C1-C6 alkylsulfonyl group, C1-C6 alkyl group, C1-C6 haloalkyl group, C3-C6 alkenyl group, C3-C6 alkynyl group, C1-C6 alkoxy group, C1-C6 haloalkoxy group or halogen atom;~~

~~R25 is C1-C6 alkyl group, C1-C6 haloalkyl group, C3-C6 alkenyl group or C3-C6 alkynyl group;~~

~~R26 is C1-C6 alkyl group, C1-C6 haloalkyl group or phenyl group optionally substituted with C1-C6 alkyl, one or two halogen atoms, one or two nitro groups, C1-C6 alkoxy group or CF3 group;~~

~~W1 is nitrogen atom or CH group;~~

~~T is a group represented by any one of the following
general formulas T-1, T-2 and T-3;~~

R¹ is hydrogen atom or halogen atom;

R² is hydrogen atom, C₁-C₈alkyl group, C₁-C₈ haloalkyl
group, halogen atom, OH group, OR²⁷ group, SH group, S(O)_pR²⁷ group,
COR²⁷ group, CO₂R²⁷ group, C(O)SR²⁷ group, C(O)NR²⁹R³⁰ group, CHO
group, CR²⁷=NOR³⁶ group, CH=CR³⁷CO₂R²⁷ group, CH₂CHR³⁷CO₂R²⁷ group,
CO₂N=CR³¹R³² group, nitro group, cyano group, NHSO₂R³³ group,
NHSO₂NHR³³ group, NR²⁷R³⁸ group, NH₂ group or phenyl group optionally
substituted with one or more and the same or different C₁-C₄ alkyl
groups;

p is 0, 1 or 2;

R³ is C₁-C₂ alkyl group, C₁-C₂ haloalkyl group, OCH₃ group,
SCH₃ group, OCHF₂ group, halogen atom, cyano group or nitro group;

R⁴ is hydrogen atom, C₁-C₃ alkyl group, C₁-C₃ haloalkyl
group or halogen atom;

R⁵ is hydrogen atom, C₁-C₃ alkyl group, halogen atom, C₁-C₃
haloalkyl group, cyclopropyl group, vinyl group, C₂ alkynyl group,
cyano group, C(O)R³⁸ group, CO₂R³⁸ group, C(O)NR³⁸R³⁹ group, CR³⁴R³⁵CN
group, CR³⁴R³⁵C(O)R³⁸ group, CR³⁴R³⁵CO₂R³⁸ group, CR³⁴R³⁵C(O)NR³⁸R³⁹
group, CHR³⁴OH group, CHR³⁴OC(O)R³⁸ group or OCHR³⁴OC(O)NR³⁸R³⁹ group,

or, when G is G-2 or G-6, R⁴ and R⁵ may form C=O group together with the carbon atom to which they are attached;

R⁶ is C₁-C₆ alkyl group, C₁-C₆ haloalkyl group, C₂-C₆ alkoxyalkyl group, C₃-C₆ alkenyl group or C₃-C₆ alkynyl group;

X¹ is single bond, oxygen atom, sulfur atom, NH group, N(C₁-C₃ alkyl) group, N(C₁-C₃ haloalkyl) group or N(allyl) group;

R⁷ is hydrogen atom, C₁-C₆ alkyl group, C₁-C₆ haloalkyl group, halogen atom, S(O)₂(C₁-C₆alkyl) group or C(=O)R⁴⁰ group;

R⁸ is hydrogen atom, C₁-C₈ alkyl group, C₃-C₈ cycloalkyl group, C₃-C₈ alkenyl group, C₃-C₈ alkynyl group, C₁-C₈ haloalkyl group, C₂-C₈ alkoxyalkyl group, C₃-C₈ alkoxyalkoxyalkyl group, C₃-C₈ haloalkynyl group, C₃-C₈ haloalkenyl group, C₁-C₈ alkylsulfonyl group, C₁-C₈ haloalkylsulfonyl group, C₃-C₈ alkoxycarbonylalkyl group, S(O)₂NH(C₁-C₈ alkyl) group, C(O)R⁴¹ group or benzyl group whose phenyl ring may be substituted with R⁴²;

n and m are independently 0, 1, 2 or 3 and m + n is 2 or 3;

Z is CR⁹R¹⁰ group, oxygen atom, sulfur atom, S(O) group, S(O)₂ group or N(C₁-C₄ alkyl) group;

each R⁹ is independently hydrogen atom, C₁-C₃ alkyl group, halogen atom, hydroxyl group, C₁-C₆ alkoxy group, C₁-C₆ haloalkyl

group, C₁-C₆ haloalkoxy group, C₂-C₆ alkylcarbonyloxy group or C₂-C₆ haloalkylcarbonyloxy group;

each R¹⁰ is independently hydrogen atom, C₁-C₃ alkyl group, hydroxyl group or halogen atom;

R¹¹ and R¹² are independently hydrogen atom, halogen atom, C₁-C₆ alkyl group, C₃-C₆ alkenyl group or C₁-C₆ haloalkyl group;

R¹³ is hydrogen atom, C₁-C₆ alkyl group, C₁-C₆ haloalkyl group, C₃-C₆ alkenyl group, C₁-C₆ haloalkenyl group, C₃-C₆ alkynyl group, C₃-C₆ haloalkynyl group, HC(=O) group, (C₁-C₄ alkyl)C(=O) group or NH₂ group;

R¹⁴ is C₁-C₆ alkyl group, C₁-C₆ alkylthio group, C₁-C₆ haloalkyl group or N(CH₃)₂ group;

W is nitrogen atom or CR¹⁵;

R¹⁵ is hydrogen atom, C₁-C₆ alkyl group, halogen atom, or phenyl group optionally substituted with C₁-C₆ alkyl group, one or two halogen atoms, C₁-C₆ alkoxy group or CF₃ group;

each Q is independently oxygen atom or sulfur atom;

Q¹ is oxygen atom or sulfur atom;

Z¹ is CR¹⁶R¹⁷ group, oxygen atom, sulfur atom, S(O) group, S(O)₂ group or N(C₁-C₄alkyl) group;

each R¹⁶ is independently hydrogen atom, halogen atom, hydroxyl group, C₁-C₆ alkoxy group, C₁-C₆ haloalkyl group, C₁-C₆

haloalkoxy group, C₂-C₆ alkylcarbonyloxy group or C₂-C₆ haloalkylcarbonyloxy group;

each R¹⁷ is independently hydrogen atom, hydroxyl group or halogen atom;

R¹⁸ is C₁-C₆ alkyl group, halogen atom or C₁-C₆ haloalkyl group;

R¹⁹ and R²⁰ are independently hydrogen atom, C₁-C₆ alkyl group, or C₁-C₆ haloalkyl group;

Z² is oxygen atom, sulfur atom, NR⁹ group or CR⁹R¹⁰ group;

R²¹ and R²² are independently C₁-C₆ alkyl group, C₁-C₆ haloalkyl group, C₃-C₆ alkenyl group, C₃-C₆ haloalkenyl group, C₃-C₆ alkynyl group or C₃-C₆ haloalkynyl group;

R²³ is hydrogen atom, halogen atom or cyano group;

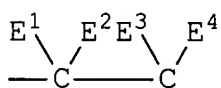
R²⁴ is C₁-C₆ alkylsulfonyl group, C₁-C₆ alkyl group, C₁-C₆ haloalkyl group, C₃-C₆ alkenyl group, C₃-C₆ alkynyl group, C₁-C₆ alkoxy group, C₁-C₆ haloalkoxy group or halogen atom;

R²⁵ is C₁-C₆ alkyl group, C₁-C₆ haloalkyl group, C₃-C₆ alkenyl group or C₃-C₆ alkynyl group;

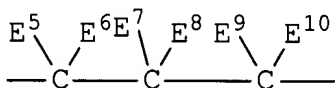
R²⁶ is C₁-C₆ alkyl group, C₁-C₆ haloalkyl group or phenyl group optionally substituted with C₁-C₆ alkyl, one or two halogen atoms, one or two nitro groups, C₁-C₆ alkoxy group or CF₃ group;

W¹ is nitrogen atom or CH group;

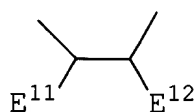
T is a group represented by any one of the following general formulas T-1, T-2 and T-3;



T-1



T-2



T-3

~~(wherein E1, E2, E3, E4, E5, E6, E7, E8, E9, E10, E11 and E12 are independently hydrogen atom or C1-C3 alkyl group);~~

~~R27 is C1-C8 alkyl group, C3-C8 cycloalkyl group, C3-C8 alkenyl group, C3-C8alkynyl group, C1-C8 haloalkyl group, C2-C8 alkoxyalkyl group, C2-C8 alkylthioalkyl group, C2-C8 alkylsulfinylalkyl group, C2-C8 alkylsulfonylalkyl group, C1-C8 alkylsulfonyl group, phenylsulfonyl group whose phenyl ring may be substituted with at least one substituent selected from the group consisting of halogen atom and C1-C4 alkyl group, C4-C8 alkoxyalkoxyalkyl group, C4-C8 cycloalkylalkyl group, C6-C8 cycloalkoxyalkyl group, C4-C8 alkenyloxyalkyl group, C4-C8 alkynyloxyalkyl group, C3-C8 haloalkoxyalkyl group, C4-C8 haloalkenyloxyalkyl group, C4-C8 haloalkynyloxyalkyl group, C6-C8 cycloalkylthioalkyl group, C4-C8 alkenylthioalkyl group, C4-C8 alkynylthioalkyl group, C1-C4 alkyl group substituted with phenoxy~~

~~group whose ring is substituted with at least one substituent selected from the group consisting of halogen atom, C1-C3 alkyl group and C1-C3 haloalkyl group, benzyloxy group whose ring is substituted with at least one substituent selected from the group consisting of halogen atom, C1-C3 alkyl group and C1-C3 haloalkyl group, C4-C8 trialkylsilylalkyl group, C3-C8 cyanoalkyl group, C3-C8 haloalkyl group, C3-C8 haloalkenyl group, C5-C8 alkoxyalkenyl group, C5-C8 haloalkoxyalkenyl group, C5-C8 alkylthioalkenyl group, C3-C8 haloalkynyl group, C5-C8 alkoxyalkynyl group, C5-C8 haloalkoxyalkynyl group, C5-C8 alkylthioalkynyl group, C2-C8 alkylcarbonyl group, benzyl group whose ring is substituted with at least one substituent selected from the group consisting of halogen atom, C1-C3 alkyl group and C1-C3 haloalkyl group, CHR34COR28 group, CHR34COOR28 group, CHR34P(O)(OR28)2 group, CHR34P(S)(OR28)2 group, CHR34C(O)NR29R30 group or CHR34C(O)NH2 group;~~

~~_____ R28 is C1-C6 alkyl group, C2-C6 alkenyl group, C3-C6 alkynyl group or tetrahydrofuran group;~~

~~_____ R29 and R31 are independently hydrogen atom or C1-C4 alkyl group;~~

~~_____ R30 and R32 are independently C1-C4 alkyl group or phenyl group whose ring may be substituted with at least one substituent~~

~~selected from the group consisting of halogen atom, C1-C3 alkyl group and C1-C3 haloalkyl group; or,~~

~~————— R29 and R30 together may form —(CH₂)₅—, —(CH₂)₄— or —CH₂CH₂OCH₂CH₂—, or the ring thus formed may be substituted with at least one substituent selected from the group consisting of C1-C3 alkyl group, phenyl group and benzyl group; or,~~

~~————— R31 and R32 may form C3-C8 cycloalkyl group together with the carbon atom to which they are attached;~~

~~————— R33 is C1-C4 alkyl group, C1-C4 haloalkyl group or C3-C6 alkenyl group;~~

~~————— R34 and R35 are independently hydrogen atom or C1-C4 alkyl group;~~

~~————— R36 is hydrogen atom, C1-C6 alkyl group, C3-C6 alkenyl group or C3-C6 alkynyl group;~~

~~————— R37 is hydrogen atom, C1-C4 alkyl group or halogen atom;~~

~~————— R38 is hydrogen atom, C1-C6 alkyl group, C3-C6 cycloalkyl group, C3-C6 alkenyl group, C3-C6 alkynyl group, C2-C6 alkoxyalkyl group, C1-C6 haloalkyl group, phenyl group whose ring may be substituted with at least one substituent selected from the group consisting of halogen atom, C1-C4 alkyl group and C1-C4 alkoxy group, —CH₂CO₂(C1-C4 alkyl) group or —CH(CH₃)CO₂(C1-C4 alkyl) group;~~

~~————— R39 is hydrogen atom, C1-C2 alkyl group or C(O)O(C1-C4 alkyl) group;~~

~~————— R40 is hydrogen atom, C1-C6 alkyl group, C1-C6 alkoxy group or NH(C1-C6 alkyl) group;~~

~~————— R41 is C1-C6 alkyl group, C1-C6 haloalkyl group, C1-C6 alkoxy group, NH(C1-C6 alkyl) group, phenyl group whose ring may be substituted with one substituent selected from the group consisting of R42 group, benzyl group and C2-C8 dialkylamino group; and~~

~~————— R42 is C1-C6 alkyl group, one or two halogen atoms, C1-C6 alkoxy group or CF3 group;~~

~~————— (3) a compound of the formula (II):~~

~~(wherein E¹, E², E³, E⁴, E⁵, E⁶, E⁷, E⁸, E⁹, E¹⁰, E¹¹ and E¹² are independently hydrogen atom or C₁-C₃ alkyl group);~~

~~————— R²⁷ is C₁-C₈ alkyl group, C₃-C₈ cycloalkyl group, C₃-C₈ alkenyl group, C₃-C₈alkynyl group, C₁-C₈ haloalkyl group, C₂-C₈ alkoxyalkyl group, C₂-C₈ alkylthioalkyl group, C₂-C₈ alkylsulfinylalkyl group, C₂-C₈ alkylsulfonylalkyl group, C₁-C₈ alkylsulfonyl group, phenylsulfonyl group whose phenyl ring may be substituted with at least one substituent selected from the group consisting of halogen atom and C₁-C₄ alkyl group, C₄-C₈ alkoxyalkoxyalkyl group, C₄-C₈ cycloalkylalkyl group, C₆-C₈ cycloalkoxyalkyl group, C₄-C₈ alkenyloxyalkyl group, C₄-C₈~~

alkynyloxyalkyl group, C₃-C₈ haloalkoxyalkyl group, C₄-C₈ haloalkenyloxyalkyl group, C₄-C₈ haloalkynyloxyalkyl group, C₆-C₈ cycloalkylthioalkyl group, C₄-C₈ alkenylthioalkyl group, C₄-C₈ alkynylthioalkyl group, C₁-C₄ alkyl group substituted with phenoxy group whose ring is substituted with at least one substituent selected from the group consisting of halogen atom, C₁-C₃ alkyl group and C₁-C₃ haloalkyl group, benzyloxy group whose ring is substituted with at least one substituent selected from the group consisting of halogen atom, C₁-C₃ alkyl group and C₁-C₃ haloalkyl group, C₄-C₈ trialkylsilylalkyl group, C₃-C₈ cyanoalkyl group, C₃-C₈ halocycloalkyl group, C₃-C₈ haloalkenyl group, C₅-C₈ alkoxyalkenyl group, C₅-C₈ haloalkoxyalkenyl group, C₅-C₈ alkylthioalkenyl group, C₃-C₈ haloalkynyl group, C₅-C₈ alkoxyalkynyl group, C₅-C₈ haloalkoxyalkynyl group, C₅-C₈ alkylthioalkynyl group, C₂-C₈ alkylcarbonyl group, benzyl group whose ring is substituted with at least one substituent selected from the group consisting of halogen atom, C₁-C₃ alkyl group and C₁-C₃ haloalkyl group, CHR³⁴COR²⁸ group, CHR³⁴COOR²⁸ group, CHR³⁴P(O)(OR²⁸)₂ group, CHR³⁴P(S)(OR²⁸)₂ group, CHR³⁴C(O)NR²⁹R³⁰ group or CHR³⁴C(O)NH₂ group;

R²⁸ is C₁-C₆ alkyl group, C₂-C₆ alkenyl group, C₃-C₆ alkynyl group or tetrahydrofuranyl group;

R²⁹ and R³¹ are independently hydrogen atom or C₁-C₄ alkyl group;

R³⁰ and R³² are independently C₁-C₄ alkyl group or phenyl group whose ring may be substituted with at least one substituent selected from the group consisting of halogen atom, C₁-C₃ alkyl group and C₁-C₃ haloalkyl group; or,

R²⁹ and R³⁰ together may form -(CH₂)₅-, -(CH₂)₄- or -CH₂CH₂OCH₂CH₂-, or the ring thus formed may be substituted with at least one substituent selected from the group consisting of C₁-C₃ alkyl group, phenyl group and benzyl group; or,

R³¹ and R³² may form C₃-C₈ cycloalkyl group together with the carbon atom to which they are attached;

R³³ is C₁-C₄ alkyl group, C₁-C₄ haloalkyl group or C₃-C₆ alkenyl group;

R³⁴ and R³⁵ are independently hydrogen atom or C₁-C₄ alkyl group;

R³⁶ is hydrogen atom, C₁-C₆ alkyl group, C₃-C₆ alkenyl group or C₃-C₆ alkynyl group;

R³⁷ is hydrogen atom, C₁-C₄ alkyl group or halogen atom;

R³⁸ is hydrogen atom, C₁-C₆ alkyl group, C₃-C₆ cycloalkyl group, C₃-C₆ alkenyl group, C₃-C₆ alkynyl group, C₂-C₆ alkoxyalkyl group, C₁-C₆ haloalkyl group, phenyl group whose ring may be

substituted with at least one substituent selected from the group consisting of halogen atom, C₁-C₄ alkyl group and C₁-C₄ alkoxy group, -CH₂CO₂(C₁-C₄ alkyl) group or -CH(CH₃)CO₂(C₁-C₄ alkyl) group;

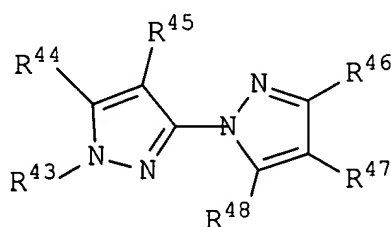
R³⁹ is hydrogen atom, C₁-C₂ alkyl group or C(O)O(C₁-C₄ alkyl) group;

R⁴⁰ is hydrogen atom, C₁-C₆ alkyl group, C₁-C₆ alkoxy group or NH(C₁-C₆ alkyl) group;

R⁴¹ is C₁-C₆ alkyl group, C₁-C₆ haloalkyl group, C₁-C₆ alkoxy group, NH(C₁-C₆ alkyl) group, phenyl group whose ring may be substituted with one substituent selected from the group consisting of R⁴² group, benzyl group and C₂-C₈ dialkylamino group; and

R⁴² is C₁-C₆ alkyl group, one or two halogen atoms, C₁-C₆ alkoxy group or CF₃ group;

(3) a compound of the formula (II):



or nipilacrofen,

~~wherein R⁴³ is C₁-C₄ alkyl group;~~

~~R⁴⁴ is C₁-C₄ alkyl group, C₁-C₄ alkylthio group, C₁-C₄ alkoxy group, C₁-C₄ haloalkyl group, C₁-C₄ haloalkylthio group or C₁-C₄ haloalkoxy group;~~

~~R43 and R44 together may form $(CH_2)_3$ or $(CH_2)_4$;~~
~~R45 is hydrogen atom or halogen atom;~~
~~R46 is hydrogen atom or C1-C4 alkyl group;~~
~~R47 is hydrogen atom, nitro group, cyano group, COOR49 group, $C(-X)NR_{50}R_{51}$ group or $C(-X_2)R_{52}$ group;~~
~~R48 is hydrogen atom, halogen atom, cyano group, C1-C4 alkyl group optionally substituted with at least one substituent selected from the group consisting of halogen atom and hydroxyl group, C1-C4 alkoxy group, phenyl group optionally substituted with at least one substituent selected from the group consisting of halogen atom, nitro group, cyano group, C1-C4 alkyl group, C1-C4 alkoxy group and halo-C1-C4 alkyl group, pyrrolyl group, C2-C8 alkyl group, C3-C8 alkenyl group, C3-C8 alkynyl group, C3-C8 alkoxy group, a group selected from the group consisting of C2-C8 alkyl group, C3-C8 alkenyl group, C3-C8 alkynyl group and C3-C8 alkoxy group into which at least one oxygen atom is inserted, or any one of groups represented by the following formulas:~~

wherein R^{43} is C₁-C₄ alkyl group;

R^{44} is C₁-C₄ alkyl group, C₁-C₄ alkylthio group, C₁-C₄ alkoxy group, C₁-C₄ haloalkyl group, C₁-C₄ haloalkylthio group or C₁-C₄ haloalkoxy group;

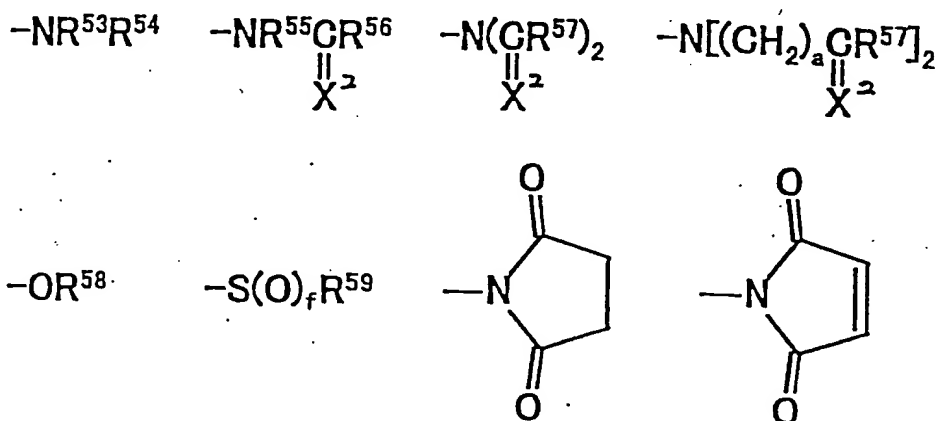
R^{43} and R^{44} together may form $-(CH_2)_3-$ or $-(CH_2)_4-$;

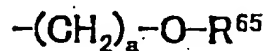
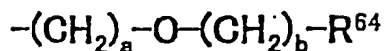
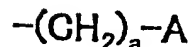
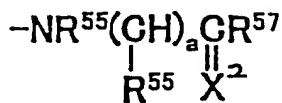
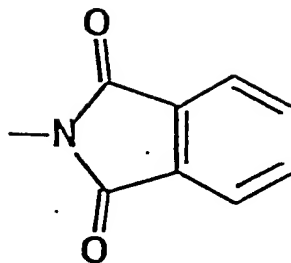
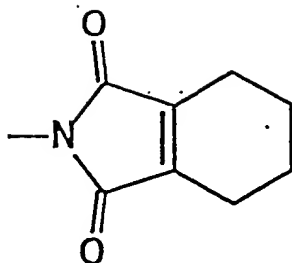
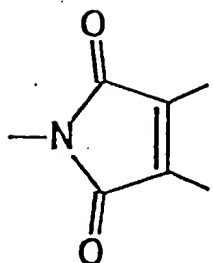
R⁴⁵ is hydrogen atom or halogen atom;

R⁴⁶ is hydrogen atom or C₁-C₄ alkyl group;

R⁴⁷ is hydrogen atom, nitro group, cyano group, -COOR⁴⁹ group, -C(=X)NR⁵⁰R⁵¹ group or -C(=X²)R⁵² group;

R⁴⁸ is hydrogen atom, halogen atom, cyano group, C₁-C₄ alkyl group optionally substituted with at least one substituent selected from the group consisting of halogen atom and hydroxyl group, C₁-C₄ alkoxy group, phenyl group optionally substituted with at least one substituent selected from the group consisting of halogen atom, nitro group, cyano group, C₁-C₄ alkyl group, C₁-C₄ alkoxy group and halo-C₁-C₄ alkyl group, pyrrolyl group, C₂-C₈ alkyl group, C₃-C₈ alkenyl group, C₃-C₈ alkynyl group, C₃-C₈ alkoxy group, a group selected from the group consisting of C₂-C₈ alkyl group, C₃-C₈ alkenyl group, C₃-C₈ alkynyl group and C₃-C₈ alkoxy group into which at least one oxygen atom is inserted, or any one of groups represented by the following formulas:





wherein R49, R50 and R52 are, the same or different, hydrogen atom or C1-C4 alkyl group;

R50 and R51 may form saturated alicyclic 5 or 6 membered ring together with the nitrogen atom to which they are attached;

R52 is hydrogen atom, C1-C4 alkyl group or C1-C4 alkyl group substituted with at least one halogen atom;

R53 is hydrogen atom, C1-C4 alkyl group optionally substituted with at least one halogen atom, C2-C6 alkenyl group optionally substituted with at least one halogen atom, C3-C6 alkynyl group optionally substituted with at least one halogen

~~atom, phenyl group optionally substituted with at least one halogen atom, C3-C8 cycloalkyl group, cyanomethyl group, or R63CO group, — R54 is hydrogen atom, C1-C6 alkyl group optionally substituted with at least one halogen atom, C2-C6 alkenyl group optionally substituted with at least one halogen atom, C3-C6 alkynyl group optionally substituted with at least one halogen atom, phenyl group optionally substituted with halogen atom, C3-C8 cycloalkyl group, cyanomethyl group, C1-C4 alkoxy C1-C6 alkyl group, — di-C1-C4 — alkylamino C1-C4 — alkyl — group, tetrahydrofurfurylmethyl group, C3-C6 alkynyloxy C1-C4 alkyl group, benzyl whose ring may be substituted with substituent selected from the group consisting of halogen atom, nitro group, cyano group, C1-C4 alkyl group, C1-C4 alkoxy group and halo C1-C4 alkyl group, — C(=X2)R63 group, — (CH2)a-(O)d-R70 group, — (CH2)a-O-(CH2)b-R70 group, — (CH2)a-X2-R76 group;~~

~~— R53 and R54 together with the nitrogen atom to which they are attached may form saturated alicyclic 3, 5 or 6 membered ring or aromatic 5 or 6 membered ring in which a carbon atom may be optionally replaced with oxygen atom;~~

~~— R55 is hydrogen atom, C1-C4 alkyl group, C2-C6 alkenyl group or C3-C6 alkynyl group, or R55 and R56 together may form — (CH2)e—;~~

~~————— R56 and R57 are independently C1-C4 alkyl group optionally substituted with at least one halogen atom, C2-C6 alkenyl group optionally substituted with at least one halogen atom, C3-C6 alkynyl optionally substituted with at least one halogen atom or phenyl group optionally substituted with at least one halogen atom, hydrogen atom, C3-C6 cycloalkyl group, —XR60 group or —NR61R62 group;~~

~~————— R58 is hydrogen atom, C1-C6 alkyl group, C2-C6 alkenyl group, C3-C6 alkynyl group, C1-C4 alkylcarbonyl group, cyano-C1-C3 alkyl group, C1-C4 alkoxy carbonyl-C1-C4 alkyl group, di-C1-C4 alkoxy carbonyl-C1-C4 alkyl group, benzyl group, C1-C4 alkoxy-C1-C4 alkynyl group, —(CH₂)_a-R75 group, —(CH₂)_a-X₂-R72 group, —(CH₂)_a-X₂—(CH₂)_b-R72 group or —(CH₂)_a-X₂—(CH₂)_b-X₂—(CH₂)_c-R72 group;~~

~~————— R59 is hydrogen atom, C1-C4 alkyl group, C2-C6 alkenyl group, C3-C6 alkynyl group, cyano-C1-C3 alkyl group, C1-C4 alkylcarbonyl-C1-C3 alkyl group or phenyl group;~~

~~————— R60 is C1-C4 alkyl group optionally substituted with at least one halogen atom;~~

~~————— R61 and R62 are, the same or different, hydrogen atom or C1-C4 alkyl group;~~

~~————— R63 is C1-C4 alkyl group optionally substituted with at least one halogen atom, C1-C4 alkoxy-C1-C4 alkyl group, C1-C4~~

~~alkylthio C1-C4 alkyl group, C3-C6 cycloalkyl group, phenyl group whose ring may be substituted with one substituent selected from the group consisting of halogen atom, nitro group, cyano group, C1-C4 alkyl group, C1-C4 alkoxy group and halo C1-C4 alkyl group, NR73R74 group or $(CH_2)_a(O)_d$ R75 group;~~

~~_____ R64 is C1-C4 alkoxy carbonyl group or carboxyl group;~~

~~_____ R65 is chloromethyl group, cyanomethyl group, C3-C6 cycloalkyl group into which at least one oxygen atom may be inserted, or C1-C4 alkoxy carbonyl C1-C4 alkyl group;~~

~~_____ R66 is hydroxyl group or NR67R68 group;~~

~~_____ A is NR67R68 group or $S(O)_f$ R69 group;~~

~~_____ R67 and R68 are, the same or different, hydrogen atom or C1-C4 alkyl group;~~

~~_____ R69 is C1-C4 alkyl group or C1-C4 haloalkyl group;~~

~~_____ R70 is hydrogen atom, hydroxyl group, halogen atom, C1-C4 alkyl group optionally substituted with at least one C1-C4 alkoxy group, C3-C6 cycloalkyl group into which at least one oxygen atom may be inserted, C3-C6 cycloalkyl group optionally substituted with one or two methyl groups, furyl group, thienyl group or $C(=O)R71$ group;~~

~~_____ R71 and R72 are, the same or different, C1-C4 alkyl group or C1-C4 alkoxy group;~~

~~_____ R73 and R74 are, the same or different, C1-C4 alkyl group or phenyl group;~~

~~_____ R75 is C3-C6 cycloalkyl into which at least one oxygen atom may be inserted, C3-C6 cycloalkyl group optionally substituted with one or two methyl groups, furyl group, thienyl group or C(=O)R71 group;~~

~~_____ R76 is C1-C4 alkyl group;~~

~~_____ a, b and c is independently 1, 2 or 3;~~

~~_____ d is 0 or 1;~~

~~_____ e is 2 or 3;~~

~~_____ f is 1 or 2; and~~

~~_____ X2 is oxygen atom or sulfur atom.~~

_____ wherein R⁴⁹, R⁵⁰ and R⁵² are, the same or different, hydrogen atom or C₁-C₄ alkyl group;

_____ R⁵⁰ and R⁵¹ may form saturated alicyclic 5 or 6 membered ring together with the nitrogen atom to which they are attached;

_____ R⁵² is hydrogen atom, C₁-C₄ alkyl group or C₁-C₄ alkyl group substituted with at least one halogen atom;

_____ R⁵³ is hydrogen atom, C₁-C₄ alkyl group optionally substituted with at least one halogen atom, C₂-C₆ alkenyl group optionally substituted with at least one halogen atom, C₃-C₆ alkynyl group optionally substituted with at least one halogen atom, phenyl

group optionally substituted with at least one halogen atom, C₃-C₈ cycloalkyl group, cyanomethyl group, or R⁶³CO- group;

R⁵⁴ is hydrogen atom, C₁-C₆ alkyl group optionally substituted with at least one halogen atom, C₂-C₆ alkenyl group optionally substituted with at least one halogen atom, C₃-C₆ alkynyl group optionally substituted with at least one halogen atom, phenyl group optionally substituted with halogen atom, C₃-C₈ cycloalkyl group, cyanomethyl group, C₁-C₄ alkoxy-C₁-C₆ alkyl group, di-C₁-C₄ alkylamino-C₁-C₄ alkyl group, tetrahydrofurfurylmethyl group, C₃-C₆ alkynyloxy-C₁-C₄ alkyl group, benzyl whose ring may be substituted with substituent selected from the group consisting of halogen atom, nitro group, cyano group, C₁-C₄ alkyl group, C₁-C₄ alkoxy group and halo-C₁-C₄ alkyl group, -C(=X²)R⁶³ group, -(CH₂)_a-(O)_d-R⁷⁰ group, -(CH₂)_a-O-(CH₂)_b-R⁷⁰ group, -(CH₂)_a-X²-R⁷⁶ group;

R⁵³ and R⁵⁴ together with the nitrogen atom to which they are attached may form saturated alicyclic 3, 5 or 6 membered ring or aromatic 5 or 6 membered ring in which a carbon atom may be optionally replaced with oxygen atom;

R⁵⁵ is hydrogen atom, C₁-C₄ alkyl group, C₂-C₆ alkenyl group or C₃-C₆ alkynyl group, or R⁵⁵ and R⁵⁶ together may form - (CH₂)_e-;

R⁵⁶ and R⁵⁷ are independently C₁-C₄ alkyl group optionally substituted with at least one halogen atom, C₂-C₆ alkenyl group optionally substituted with at least one halogen atom, C₃-C₆ alkynyl optionally substituted with at least one halogen atom or phenyl group optionally substituted with at least one halogen atom, hydrogen atom, C₃-C₆ cycloalkyl group, -XR⁶⁰ group or -NR⁶¹R⁶² group;

R⁵⁸ is hydrogen atom, C₁-C₆ alkyl group, C₂-C₆ alkenyl group, C₃-C₆ alkynyl group, C₁-C₄ alkylcarbonyl group, cyano-C₁-C₃ alkyl group, C₁-C₄ alkoxy carbonyl-C₁-C₄ alkyl group, di-C₁-C₄ alkoxy carbonyl-C₁-C₄ alkyl group, benzyl group, C₁-C₄ alkoxy-C₁-C₄ alkynyl group, -(CH₂)_a-R⁷⁵ group, -(CH₂)_a-X²-R⁷² group, -(CH₂)_a-X²-(CH₂)_b-R⁷² group or -(CH₂)_a-X²-(CH₂)_b-X²-(CH₂)_c-R⁷² group;

R⁵⁹ is hydrogen atom, C₁-C₄ alkyl group, C₂-C₆ alkenyl group, C₃-C₆ alkynyl group, cyano-C₁-C₃ alkyl group, C₁-C₄ alkylcarbonyl-C₁-C₃ alkyl group or phenyl group;

R⁶⁰ is C₁-C₄ alkyl group optionally substituted with at least one halogen atom;

R⁶¹ and R⁶² are, the same or different, hydrogen atom or C₁-C₄ alkyl group;

R⁶³ is C₁-C₄ alkyl group optionally substituted with at least one halogen atom, C₁-C₄ alkoxy-C₁-C₄ alkyl group, C₁-C₄ alkylthio-C₁-C₄ alkyl group, C₃-C₆ cycloalkyl group, phenyl group

whose ring may be substituted with one substituent selected from the group consisting of halogen atom, nitro group, cyano group, C₁-C₄ alkyl group, C₁-C₄ alkoxy group and halo-C₁-C₄ alkyl group, -NR⁷³R⁷⁴ group or -(CH₂)_a-(O)_d-R⁷⁵ group;

R⁶⁴ is C₁-C₄ alkoxycarbonyl group or carboxyl group;

R⁶⁵ is chloromethyl group, cyanomethyl group, C₃-C₆ cycloalkyl group into which at least one oxygen atom may be inserted, or C₁-C₄ alkoxycarbonyl-C₁-C₄ alkyl group;

R⁶⁶ is hydroxyl group or -NR⁶⁷R⁶⁸ group;

A is -NR⁶⁷R⁶⁸ group or -S(O)_f-R⁶⁹ group;

R⁶⁷ and R⁶⁸ are, the same or different, hydrogen atom or C₁-C₄ alkyl group;

R⁶⁹ is C₁-C₄ alkyl group or C₁-C₄ haloalkyl group;

R⁷⁰ is hydrogen atom, hydroxyl group, halogen atom, C₁-C₄ alkyl group optionally substituted with at least one C₁-C₄ alkoxy group, C₃-C₆ cycloalkyl group into which at least one oxygen atom may be inserted, C₃-C₆ cycloalkyl group optionally substituted with one or two methyl groups, furyl group, thienyl group or -C(=O)R⁷¹ group;

R⁷¹ and R⁷² are, the same or different, C₁-C₄ alkyl group or C₁-C₄ alkoxy group;

R⁷³ and R⁷⁴ are, the same or different, C₁-C₄ alkyl group or phenyl group;

R⁷⁵ is C₃-C₆ cycloalkyl into which at least one oxygen atom may be inserted, C₃-C₆ cycloalkyl group optionally substituted with one or two methyl groups, furyl group, thienyl group or -C(=O)R⁷¹ group;

R⁷⁶ is C₁-C₄ alkyl group;

a, b and c is independently 1, 2 or 3;

d is 0 or 1;

e is 2 or 3;

f is 1 or 2; and

X² is oxygen atom or sulfur atom.

Claims 52-69. (Canceled).

Claim 70. (Previously Presented) The method according to claim 24, wherein said variant further lacks the chloroplast transit signal.